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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

COX, ALEXIS K

ART UNIT	PAPER NUMBER
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3744

NOTIFICATION DATE	DELIVERY MODE
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06/08/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

Office Action Summary	Application No. 10/575,720	Applicant(s) SJODIN ET AL.	
	Examiner ALEXIS K. COX	Art Unit 3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2010 and 26 April 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-65 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 31, 34-49, 52 and 54-65 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/26/2010</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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4. Claims 31, 34, 37-41, 44-47, 49, 52-55 and 58-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuerschbach et al (US Patent No. 4,815,534) in view of Usui (US Patent No. 4,223,826) and Mizuhara (US Patent No. 4,497,722).

Regarding claims 31, 34, 37-41, 44-47, 63, and 64, Fuerschbach et al teach a plate heat exchanger (10, see column 4 lines 25-26) comprising a number of heat exchanger plates (see column 2 lines 8-11), which are arranged beside each other and connected to each other by means of a braze connection (see column 5, lines 15-16) accomplished by means of a braze process (see column 6 lines 59-64; claim 34), wherein the heat exchanger plates are substantially manufactured in stainless steel containing chromium (see column 6 lines 18-20), wherein the plate heat exchanger includes a number of port channels extending through at least some of the heat exchanger plates (40, 41, 40a, 41a, see column 5 lines 49-54) including an outer heat exchanger plate, wherein one or more of the port channels are surrounded by a connection surface (22, see column 5 lines 49-50), which is the portion of the braze alloy sheet which connects the port channels to the pipe member by surrounding the port channel via the connection member, and is for connection of the one or more port channels to a pipe member (see column 5 lines 66-67), as pipes are what pipe nipples connect to. Fuerschbach further teach the connection member to be designed as a pipe nipple (IH, OH, see column 5 lines 66-67), with the connection surface being that portion of the pipe nipple which changes composition by brazing with the braze alloy sheet. It is noted that Fuerschbach et al do not explicitly teach the connection surface to include a material to permit brazing of the pipe member to the connection surface in a

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more easy manner than to stainless steel, the material being more reduction susceptible than chromium dioxide, or for that material to be based on nickel. However, the method of Usui teaches the use of a connection surface between stainless steel and stainless steel or another metal (see column 2 lines 49-53). Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the system of Fuerschbach et al using the brazing technique of Usui, as the brazing of Usui results in a stronger bond than traditional brazing methods. Mizuhara teaches 5-35% palladium, 20-84% copper, and 10-50% nickel as a brazing alloy (column 1, lines 59-65). The available percentages of materials taught by Mizuhara include brazing alloys based on nickel. Therefore, the substitution of the brazing alloy of Mizuhara would have been obvious to one of ordinary skill in the art at the time of the invention, as the brazing alloy of Mizuhara is structurally equivalent to that of Usui, and a simple substitution does not render a structure patentably distinct over an existing structure. Further, regarding claims 31 and 34-36, the examiner recognizes that these claims are deemed "product-by-process" type claims. In product-by-process claims, "once a product appearing to be substantially identical is found and a 35 U.S.C. 102/103 rejection [is] made, the burden shifts to the applicant to show an unobvious difference." MPEP 2113. This rejection under 35 U.S.C. 102/103 is proper because the "patentability of a product does not depend on its method of production." In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985).

Regarding claims 49, 52, 54-55 and 58-60, the structural requirements of the method of these claims is filled by the system of Fuerschbach et al when manufactured

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with the method of Usui and the material substitution of Mizuhara, as shown above.

Further, the step of brazing may take place at vacuum-like pressure (see column 6 lines 60-61 of Fuerschbach) or in an atmosphere with substantially inert air gas (see column 2 lines 13-15 of Fuerschbach), and brazing causes material to be bound through diffusion by definition, as can be seen from the Encyclopedia Britannica article referenced below. Additionally, the method of Fuerschbach et al as modified by the method of Usui requires applying the connection member to the outer surface area at each port channel before the joining of heat exchanger plates (see column 6 lines 56-64) and applying the material for forming the connection surface during the braze process.

Regarding claims 61 and 62, the structural requirements of the method steps of these claims is filled by the system of Fuerschbach et al when manufactured with the method of Usui and the material substitution of Mizuhara, as shown above. Further, the step of brazing may take place at vacuum-like pressure (see column 6 lines 60-61 of Fuerschbach) or in an atmosphere with substantially inert air gas (see column 2 lines 13-15 of Fuerschbach). Additionally, the method of Fuerschbach et al as modified by the method of Usui requires applying the connection member to the outer surface area at each port channel before the joining of heat exchanger plates (see column 6 lines 56-64 of Usui), and for pressing the plates to be brazed together to be part of the conventional brazing process (see column 1 lines 9-13 of Usui), and the arrangement of the parts being brazed to be "by a conventional method" (see column 3 lines 5-7 of Usui), thereby disclosing pressing the plates together. As the purpose of Usui is to be a

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method of brazing stainless steels, and Fuerschbach discloses a brazed heat exchanger, the use of the method of Usui for the manufacture of the product of Fuerschbach would have been obvious to one of ordinary skill in the art at the time of the invention.

5. Claims 35, 36, and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuerschbach et al (US Patent No. 4,815,534) in view of Usui (US Patent No. 4,223,826) and Mizuhara (US Patent No. 4,497,722), and further in view of Wells (US Patent No. 3,675,311).

Regarding claims 35, 36 and 56, it is noted that the combination of Fuerschbach et al, Usui, and Mizuhara do not explicitly teach the material to be bound to the stainless steel by diffusion. However, the method of Wells teaches the material of Fuerschbach et al in view of Usui and Mizuhara to be bound to the stainless steel by diffusion brazing (see column 1 lines 67-70). Further, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the method of Wells to modify the system of Fuerschbach et al in view of Usui and Mizuhara in order to perform diffusion brazing, which results in a stronger joint strength.

6. Claims 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuerschbach et al (US Patent No. 4,815,534) in view of Usui (US Patent No. 4,223,826) and Mizuhara (US Patent No. 4,497,772), and further in view of the Encyclopedia Britannica 15th edition brazing article.

Regarding claims 42 and 43, the system of Fuerschbach in view of Usui teaches the material to have been applied onto the primary surface by means of and during a

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braze process, as shown above. It is noted that the system and method of Fuerschbach et al in view of Usui and Mizuhara do not teach the use of abrasive blasting or any similar roughening process to facilitate the wetting of the primary surface with the material. However, it is well-known that "preparation of the surfaces by mechanical or chemical cleaning is important for brazing" (Encyclopedia Britannica, 15h edition, volume 2, page 489, brazing, lines 29-31 of the article; claim 42), and it would therefore have been obvious to one of ordinary skill in the art at the time of the invention to use mechanical abrasive cleaning in place of a chemical bath in the system of Fuerschbach et al in view of Usui and Mizuhara. Further regarding claims 42 and 43, the examiner notes that the patentability of a product is not determined by means of production, but by the end product itself, and therefore the process is given little patentable weight provided all structural limitations are met.

7. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fuerschbach et al (US Patent No. 4,815,534) in view of Usui (US Patent No. 4,223,826) and Mizuhara (US Patent No. 4,497,772), and further in view of Blomgren (US Patent No. 6,016,865).

Regarding claim 48, it is noted that the system of Fuerschbach et al in view of Usui and Mizuhara do not explicitly teach the use of a washer for the connecting member. However, Blomgren teaches the use of a washer (15, see column 4, lines 7-9) as a connection member, and wherein the washer is brazed to the heat exchanger of Blomgren. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the washer of Blomgren in the system of Fuerschbach et

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al in view of Usui and Mizuhara as a connector in order to reduce material costs to the manufacturer of the heat exchanger, displacing them to the manufacturer of pipes and surrounding equipment. Further regarding claim 48, the examiner notes that the patentability of a product is not determined by means of production, but by the end product itself, and therefore the process is given little patentable weight provided all structural limitations are met.

8. Claim 57 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fuerschbach et al (US Patent No. 4,815,534) in view of Usui (US Patent No. 4,223,826) and Mizuhara (US Patent No. 4,497,772), and further in view of Wells (US Patent No. 3,675,311) and furthermore in view of the Encyclopedia Britannica 15th edition brazing article.

Regarding claim 57, it is noted that the method of Fuerschbach et al in view of Usui and Mizuhara do not explicitly teach the use of abrasive blasting or any similar roughening process to facilitate the wetting of the primary surface with the material. However, it is well-known that "preparation of the surfaces by mechanical or chemical cleaning is important for brazing" (Encyclopedia Britannica, 15h edition, volume 2, page 489, brazing, lines 29-31 of the article), and it would therefore have been obvious to one of ordinary skill in the art at the time of the invention to use mechanical abrasive cleaning in place of a chemical bath in the system of Fuerschbach et al in view of Usui and Mizuhara and further in view of Wells.

Response to Arguments

9. Applicant's arguments filed 2/09/2010 have been fully considered but they are not persuasive. The reasons are as follows.

The applicant states on page 9 that an interview took place in January in which it was indicated that another non-final action would be sent, with more references concerning the commonness of the use of nickel to braze stainless steel plates together. This is, in fact, the case; for this reason, this office action is non-final.

It is argued on page 10 that no cited references suggest that a problem existed with connecting pipe members to the heat exchanger of Fuerschbach.

In response to applicant's argument that there is no teaching, suggestion, or motivation to combine the references, the examiner recognizes that obviousness may be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988), *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992), and *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398, 82 USPQ2d 1385 (2007). In this case, Usui explicitly discloses a stronger result than by traditional brazing means, which constitutes a reason stated within the art; further, the applicant's attention is called to MPEP section 2144.06, part II, SUBSTITUTING EQUIVALENTS KNOWN FOR THE SAME PURPOSE, as well as Stewart, Jr. et al (US Patent No. 4,606,495), which explicitly indicates it to be conventional to use "nickel, chromium, silver, etc." when

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brazing (see column 2 lines 29-41); further, the applicant's own submitted prior art from the IDS of 4/26/2010 clearly discloses it to be known to use a nickel based cladding for the purpose of brazing in order to increase the strength of the resulting bond (see JP 01-157768, published in 1989).

It is argued on page 11 that "even if a person of ordinary skill had a reason to somehow combine the cited references, the claimed subject matter would not have been produced."

It is true that Mizuhara discloses a nickel-containing brazing alloy, not a separately applied connection surface. It is also true that Usui discloses a copper-based separately applied connection surface, which is formed by plating prior to brazing; and that Usui uses a brazing material of the same base as the separately applied connection surface, in order to form the best connection.

Given that the method of Usui involves plating the stainless steel with a material with the same base metal as the brazing material, and given that the material of Mizuhara is nickel-based, as any material made of 50% nickel combined with two other materials must be considered nickel-based, the substitution of the nickel based material in the method of Usui as applied to the heat exchanger of Fuerschbach would also comprise using nickel, and not copper, for the material used in the plating of the stainless steel plates.

It is argued on page 11 that Mizuhara's brazing material is not structurally equivalent to Usui's copper plating because Mizuhara's brazing material includes whereas Usui's copper plating does not include nickel.

Structural equivalence is defined as an element which performs the function specified in the claim in substantially the same manner as the function is performed by the corresponding element described in the specification. It does not require an identical material be used. (see MPEP 2183, Making a Pima Facie Case of Equivalence)

As noted in the previous action, all brazed materials are bound by some degree of diffusion; in the final product, the nickel-based material of Mizuhara is performing the same function in the same manner as the copper-based material of Usui. A mere statement that the materials used are different does not constitute a showing that the element is not an equivalent.

Second, it is argued that the brazing material of Mizuhara is not a simple substitution for Usui's copper plating because Usui's copper is for plating and Mizuhara's material is for brazing. This is misleading at best; as explained above, it is still a simple substitution of equivalent materials.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

On page 13, it is argued that the Wells patent merely discloses thin-film diffusion brazing of nickel and nickel base alloys by producing a coated material and placing the coated material between adjacent surfaces to be bonded.

In response to applicant's argument that Wells is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Wells relates to the field of brazing.

The argument on page 14, concerning the use of a connection surface, constitutes arguing references separately; the presence of a connection surface is provided by the inclusion of Usui.

In response to applicant's argument that the examiner has combined an excessive number of references, reliance on a large number of references in a rejection does not, without more, weigh against the obviousness of the claimed invention. See *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).

Applicant's arguments on page 15 concerning claims 42 and 43 fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

In response to applicant's argument on page 15 that the examiner has combined an excessive number of references, reliance on a large number of references in a

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rejection does not, without more, weigh against the obviousness of the claimed invention. See *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).

In response to applicant's argument that Blomgren is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Blomgren is in the field of constructing heat exchangers.

In response to applicant's argument on page 15 concerning claim 48 that the examiner has combined an excessive number of references, reliance on a large number of references in a rejection does not, without more, weigh against the obviousness of the claimed invention. See *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).

Regarding claim 57, a repetition is made of the argument concerning "missing" claim limitations from claim 49; it is no more persuasive upon repetition than it was initially.

In response to applicant's argument on page 16 regarding claim 57 that the examiner has combined an excessive number of references, reliance on a large number of references in a rejection does not, without more, weigh against the obviousness of the claimed invention. See *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991).

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Regarding claim 63, which the applicant acknowledges contains essentially the features of claim 35, the argument is no more persuasive upon repetition than it was concerning claim 35.

Regarding claims 64 and 65, again, repetition does not increase the persuasiveness of an argument.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXIS K. COX whose telephone number is (571)270-5530. The examiner can normally be reached on Monday through Thursday 9:00a.m. to 6:30p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frantz Jules or Cheryl Tyler can be reached on 571-272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/AKC/

/Frantz F. Jules/
Supervisory Patent Examiner, Art Unit 3744